

AMENDMENTS TO THE CLAIMS

Please replace all prior versions, and listings, of claims in the application with the following list of claims:

1. (Withdrawn) A method of obtaining a substantially pure cannabinoid or cannabinoid acid or a product enriched in a given cannabinoid or cannabinoid acid from a plant material, comprising:

i) obtaining an extract containing a cannabinoid or cannabinoid acid from a plant material;

ii) subjecting the extract of step (i) to a chromatographic step to produce a partially purified extract;

iii) dissolving the partially purified extract in a first solvent, removing any insoluble material therefrom and removing the solvent; and

iv) dissolving the product obtained in step iii) in a second solvent, removing any insoluble material therefrom, and removing the solvent to obtain the substantially pure cannabinoid or cannabinoid acid or the product enriched in a given cannabinoid or cannabinoid acid, wherein the first and second solvents are different, and wherein one of the first or second solvents is a solvent which is substantially more polar than the cannabinoid/cannabinoid acid which it is desired to purify, and the other solvent is a solvent which is substantially less polar than the cannabinoid/cannabinoid acid which it is desired to purify.

2. (Withdrawn) A method according to claim 1 wherein one of the solvents is an alcohol.

3. (Withdrawn) A method according to claim 2 wherein one of the solvents is methanol.

4. (Withdrawn) A method according to claim 1 wherein one of the solvents is a straight or branched chain C5-C12 alkane.

5. (Withdrawn) A method according to claim 4 wherein one of the solvents is pentane.

6. (Withdrawn) A method according to claim 5 wherein one of the solvents is pentane and the other solvent is methanol.
7. (Withdrawn) A method according to claim 1 wherein the extract containing a cannabinoid or cannabinoid acid obtained in step (i) is prepared by a process comprising solvent extraction of the plant material.
8. (Withdrawn) A method according to claim 7 wherein step (i) comprises dissolving the plant material in an extraction solvent, removing any insoluble material from the resultant solution and removing the solvent to form an extract containing a cannabinoid or cannabinoid acid.
9. (Withdrawn) A method according to claim 7 wherein the extraction solvent is a non-polar solvent, ethanol, methanol or carbon dioxide.
10. (Withdrawn) A method according to claim 9 wherein the non-polar solvent comprises a straight or branched chain C5-C12 alkane.
11. (Withdrawn) A method according to claim 10 wherein the non-polar solvent is hexane.
12. (Withdrawn) A method according to claim 7, wherein the extraction solvent is acidified.
13. (Withdrawn) A method according to claim 12 wherein the extraction solvent is an acidified non-polar solvent.
14. (Withdrawn) A method according to claim 13 wherein the extraction solvent is an acidified straight or branched chain C5-C12 alkane.

15. (Withdrawn) A method according to claim 14 wherein the extraction solvent is 0.1% v/v acetic acid in hexane.
16. (Withdrawn) A method according to claim 1, which includes a further step, prior to step (i), of decarboxylating the plant material.
17. (Withdrawn) A method according to claim 1 wherein the extract containing a cannabinoid or cannabinoid acid obtained in step (i) comprises a botanical drug substance derived from the plant material.
18. (Withdrawn) A method according to claim 17 wherein the botanical drug substance is prepared by a process comprising solvent extraction of the plant material.
19. (Withdrawn) A method according to claim 18 wherein the botanical drug substance is prepared by extraction with carbon dioxide.
20. (Withdrawn) A method according to claim 19 wherein the botanical drug substance is prepared by a process comprising extraction with carbon dioxide (CO₂), followed by a secondary extraction step to remove a proportion of the non-target materials.
21. (Withdrawn) A method according to claim 20 wherein the secondary extraction step is ethanolic precipitation.
22. (Withdrawn) A method according to claim 20 wherein the process for preparing the botanical drug substance further includes a charcoal clean-up step.
23. (Withdrawn) A method according to claim 22 wherein the botanical drug substance is prepared by a process comprising:
- i) optional decarboxylation of the plant material,

ii) extraction with liquid CO₂, to produce a crude botanical drug substance,
iii) precipitation with C1-C5 alcohol to reduce the proportion of non-target materials,
iv) removal of the precipitate,
v) treatment with activated charcoal, and
vi) evaporation to remove C1-C5 alcohol and water, thereby producing a final botanical drug substance.

24. (Withdrawn) A method according to claim 1 wherein the chromatographic step comprises column chromatography.

25. (Withdrawn) A method according to claim 1 wherein the chromatographic step is based on molecular sizing and polarity.

26. (Withdrawn) A method according to claim 25 wherein the chromatographic step is carried out using a Sephadex™ LH-20 matrix.

27. (Withdrawn) A method according to claim 26 wherein the chromatographic step is carried out using a 2:1 mixture of chloroform/dichloromethane as solvent.

28.-39. (Canceled)

40. (Withdrawn) A method according to claim 1 which comprises a further step v) of:
v) loading the substantially pure cannabinoid or cannabinoid acid or the product enriched in a given cannabinoid or cannabinoid acid onto a Chromabond Flash BT 12M silica cartridge column, eluting with hexane:ethyl acetate (98:2) at a flow rate of approximately 5 ml/min.

41.-91. (Canceled)

92. (Withdrawn) A method of producing Δ^9 THCA crystals comprising:

- i) preparing an extract of the cannabis plant material with 0.1% v/v acetic acid in hexane,
- ii) filtering the resultant extract and removing solvent from the filtrate by rotary evaporation to form an extract enriched in Δ^9 THCA,
- iii) passing a solution of the resulting Δ^9 tetrahydrocannabinolic acid (Δ^9 THCA) enriched extract through a column packed with Sephadex-LH20™, eluting with 2:1 chloroform/dichloromethane,
- iv) collecting Δ^9 THCA rich fractions eluted from the column and removing solvent by rotary evaporation,
- v) re-dissolving the crude Δ^9 THCA obtained in step iv) in methanol, removing insoluble residue by filtration and removing solvent from the filtrate by rotary evaporation, and
- vi) re-dissolving the product of step v) in pentane, removing insoluble residue by filtration and removing solvent from the filtrate by rotary evaporation to produce said Δ^9 THCA crystals.

93. (Withdrawn) A substantially pure preparation of Δ^9 tetrahydrocannabinolic acid (Δ^9 THCA) obtained by the method of claim 92, having a chromatographic purity of greater than 95%, more preferably greater than 96%, more preferably greater than 97% or most preferably greater than 98% by area normalisation of an HPLC profile.

94. (Withdrawn) A method of producing cannabidiolic acid (CBDA) crystals from plant material comprising:

- i) preparing an extract of cannabis plant material with 0.1% v/v acetic acid in hexane,
- ii) filtering the resultant extract and removing solvent from the filtrate by rotary evaporation to form an extract enriched in CBDA,
- iii) passing a solution of the resulting CBDA enriched extract through a column packed with a matrix of hydroxypropylated cross-linked dextrans, eluting with 2:1 chloroform/dichloromethane,
- iv) collecting CBDA rich fractions eluted from the column and removing solvent by rotary evaporation,

v) re-dissolving the crude CBDA obtained in step iv) in methanol, removing insoluble residue by filtration and removing solvent from the filtrate by rotary evaporation, and

vi) re-dissolving the product of step v) in pentane, removing insoluble residue by filtration and removing solvent from the filtrate by rotary evaporation to produce said CBDA crystals.

95. (Withdrawn) A substantially pure preparation of cannabidiolic acid (CBDA) crystals obtained by the method of claim 94, having a chromatographic purity of greater than 90%, more preferably greater than 92% or most preferably greater than 94% by area normalisation of an HPLC profile.

96. (Withdrawn) A method of producing a semi-solid preparation of Δ^9 tetrahydrocannabinolic acid (Δ^9 THC) comprising:

i) obtaining an ethanolic solution of a botanical drug substance from decarboxylated cannabis plant material,

ii) passing the solution obtained in step i) through a column of activated charcoal, and collecting the eluate,

iii) remove solvent from the eluate by rotary evaporation to give a Δ^9 THC enriched fraction,

iv) passing a solution of the resulting Δ^9 THC enriched extract through a column packed with Sephadex LH20, eluting with 2:1 chloroform/dichloromethane,

v) collecting Δ^9 THC rich fractions and removing solvent by rotary evaporation,

vi) re-dissolving the crude Δ^9 THC prepared in step v) in methanol, removing insoluble residue by filtration and removing solvent from the filtrate by rotary evaporation, and

vii) re-dissolving the crude Δ^9 THC prepared in step vi) in pentane, removing insoluble residue by filtration and removing solvent from the filtrate by rotary evaporation to give a semi-solid preparation of Δ^9 THC.

97. (Withdrawn) A substantially pure preparation of Δ^9 tetrahydrocannabinol (Δ^9 THC) obtained by the method of claim 96, having a chromatographic purity of >99% by area normalisation of an HPLC profile.

98. (Currently amended) A method for producing Δ^9 tetrahydrocannabivarin ~~tetrahydrocannabinol~~ (Δ^9 THCV) crystals comprising:

- i) obtaining an ethanolic solution of a botanical drug substance from cannabis plant material,
- ii) passing the solution obtained in step i) through a column of activated charcoal, and collecting the eluate,
- iii) remove solvent from the eluate by rotary evaporation to give a Δ^9 THCV enriched fraction,
- iv) passing a solution of the resulting Δ^9 THCV enriched extract through a column packed with Sephadex LH20, eluting with 2:1 chloroform/dichloromethane,
- v) collecting Δ^9 THCV rich fractions and removing solvent by rotary evaporation,
- vi) re-dissolving the crude Δ^9 THCV prepared in step v) in methanol, removing insoluble residue by filtration and removing solvent from the filtrate by rotary evaporation, and
- vii) re-dissolving the crude Δ^9 THCV prepared in step vi) in pentane, removing insoluble residue by filtration and removing solvent from the filtrate by rotary evaporation to give said crystals of Δ^9 THCV.

99. (Previously presented) A substantially pure preparation of Δ^9 tetrahydrocannabivarin (Δ^9 THCV) obtained by the method of claim 98, having a chromatographic purity of greater than 95%, more preferably greater than 96%, more preferably greater than 97%, more preferably greater than 98%, and most preferably greater than 99% by area normalisation of an HPLC profile.

100. (Withdrawn) A method for producing a highly enriched cannabigerol (CBG) extract or substantially pure CBG from cannabis plant material comprising:

- i) decarboxylating the cannabis plant material,
- ii) preparing an extract of the decarboxylated cannabis plant material with hexane,
- iii) filtering the resultant extract and removing solvent from the filtrate by rotary evaporation to form an extract enriched in CBG,
- iv) passing a solution of the resulting CBG enriched extract through a column packed with Sephadex-LH20™, eluting with 2:1 chloroform/dichloromethane,
- v) collecting CBG rich fractions eluted from the column and removing solvent by rotary evaporation,
- vi) re-dissolving the crude CBG obtained in step v) in methanol, removing insoluble residue by filtration and removing solvent from the filtrate by rotary evaporation, and
- vii) re-dissolving the product of step vi) in pentane, removing insoluble residue by filtration and removing solvent from the filtrate by rotary evaporation to produce a highly enriched CBG extract or substantially pure cannabigerol.

101. (Withdrawn) A product enriched in cannabigerol (CBG) obtained by the method of claim 100, having a chromatographic purity of greater than 90%, preferably greater than 92% by area normalisation of an HPLC profile.

102. (Withdrawn) A method of producing a highly enriched cannabichromene (CBC) extract from cannabis plant material comprising:

- i) decarboxylating the cannabis plant material,
- ii) preparing an extract of the decarboxylated cannabis plant material with hexane,
- iii) filtering the resultant extract and removing solvent from the filtrate by rotary evaporation to form an extract enriched in CBC,
- iv) passing a solution of the resulting CBC enriched extract through a column packed with Sephadex-LH20™, eluting with 2:1 chloroform/dichloromethane,

v) collecting CBC rich fractions eluted from the column and removing solvent by rotary evaporation,

vi) re-dissolving the crude CBC obtained in step v) in methanol, removing insoluble residue by filtration and removing solvent from the filtrate by rotary evaporation, and

vii) re-dissolving the product of step vi) in pentane, removing insoluble residue by filtration and removing solvent from the filtrate by rotary evaporation to produce a highly enriched CBC extract.

103. (Withdrawn) A product enriched in cannabichromene (CBC) obtained by the method of claim 102, having a chromatographic purity of greater than 80%, more preferably greater than 85% by area normalisation of an HPLC profile.